1. Introduction and Who Guideline applies to

1.1 This document sets out the University Hospitals of Leicester (UHL) NHS Trusts Policy and Procedures to ensure immunoglobulin is administered safely to maximise the benefits of therapyfor patients with immunodeficiency, and to minimise the risks associated with administration of immunoglobulin.

1.2 This policy emphasises the administration of immunoglobulin to be given on the Medical Day Case Unit (MDCU). However, this policy is transferable to the administration of immunoglobulin within UHL, under the direct care of the Clinical Immunology department.

1.3 The immunology clinical nurse specialists and medical staff who are involved in the care and management of patients with antibody deficiency.

1.4 Medical staff and qualified nursing staff within UHL who are administering Immunoglobulin replacement therapy for in-patients (under the long term care of the clinical immunology department, UHL).

1.5 Staff administrating Immunoglobulin must have documented competencies in the following:

- IV cannulation
- IV administration
- Phlebotomy
- Aseptic Non-Touch Technique

1.6 Adult patients only – for IV administration in Paedriactrics, please contact the Paediatric day ward (LRI) or the Immunology Paediactric Specialist Nurse (LRI) on 0116 258 6711

http://insitetogether.xuhl-tr.nhs.uk/pag/pagdocuments/Subcutaneous%20Immunoglobulin%20Administration%20UHL%20Childrens%20Nursing%20Guideline.pdf

2. Guideline Standards and Procedures

2.1 To meet national criteria all requests must meet the standards outlined in the "Commissioning Criteria Policy for the use of therapeutic immunoglobulin (Ig) England“ (2021). Following this a request form should be submitted to the immunoglobulin mailbox. If prior approval is required for the indication you must wait until the next Immunoglobulin Approval Panel (IAP), unless urgent where it should be emailed to panel members as well highlighting urgent. All cases should be approved in the local immunology MDT or by internal email discussion if urgent.

2.2 Once approval has been met continue as follows:

a) Ensure that the patient has been involved in all discussions and decisions regarding their treatment and treatment options, including the risk of potential transmission of infective agents (UK PIN, 2004).

b) Ensure that the patient has received relevant information;

The options are as follows:

- Intravenous immunoglobulin replacement therapy (IVIg)

Usually administered at 3 weekly intervals on the MDCU. However, this can be adjusted to maintain satisfactory Immunoglobulin (IgG) levels.

- Subcutaneous immunoglobulin replacement therapy (SCIG) or Facilitated Subcutaneous immunoglobulin replacement therapy (fSCIG).

  Self administered in the patient's home environment via an infusion pump on a weekly basis, or manual rapid push a few times per week. This can be adjusted to maintain satisfactory Immunoglobulin (IgG) levels. Please note fSCIg is not offered as home therapy.Please see UHL Administration of SCIg policy for further advice.

Patient information can be found on the following accredited website:

www.immunodeficiencyuk.org

c) The Immunology clinical nurse specialist should support the patient with deciding a preferred delivery method and address any questions or concerns (UK PIN, 2018).

d) Availability of Immunoglobulin is subject to a national framework due to rising costs of products. This means that Trusts receive guidance from NHS England regarding which products to prescribe. Close liaison with the dedicated pharmacy team at UHL will allow for a prescribing decision to be made regarding which Immunoglobulin products are currently available.

   (NB although it is preferable for a patient to remain on a consistent product, it is occasionally necessary to change Immunoglobulin products in established patients based on product availability and NHS England recommendations).

e) The reviewing clinician (either in clinic or on the day case unit) must complete an immunoglobulin database follow-up form and send to the pharmacist responsible for managing immunoglobulin within UHL for input into the National Database.The immunoglobulin database form should be completed at every review, minimum annually.

f) The Immunology Team should prescribe the following:

   - The agreed immunoglobulin product with the agreed route. The starting dose is usually 400mg/kg/month, but may be adjusted in individual patients (TRIAC, 2016).
   - Oral Paracetamol 1g (PRN for adverse event management)
   - IV Hydrocortisone 100mg (PRN for adverse event management)
   - IV Chlorphenamine 10mg (PRN for adverse event management)

g) There should be appropriate storage facilities for all Immunoglobulin products. These include a locked, temperature recorded fridge, and a locked medicine cupboard with recording facilities to monitor room temperature. Such recording should be documented and acted on as per the UHL Leicestershire Medicines Code Policy (Trust Ref. B60/2011)

   - Ensure that any immunoglobulin products are stored as per manufacturer's guidelines, are within expiry date and the solution for infusion looks clear.

2.3 On the first infusion (INGID, 2019)

a) Record base line observations – Blood pressure, Heart rate, Respiratory rate, Oxygen saturations and Temperature - to assess for an active infection.

b) Assess if the patient has a current infection, or is producing green/ discoloured sputum. If so obtain a sputum sample for culture and sensitivity.

   If the patient has an active infection, antibiotics should be given as per antibiotic guidelines and postpone the infusion for 48 hours, or until the patients' symptoms have started to improve. The clinical team should be informed and a decision made to whether the patient requires a medical review, either by his/her GP, the Immunology Team or the on-call medical registrar.

c) The Consultant Immunologist, Immunology Trainee (Registrar) or Immunology Clinical Nurse Specialist need to obtain informed consent. Here the benefits/risks and possible adverse reactions are discussed, if not already done in the Outpatient clinic. A consent form should be signed using the standard sticker for consent.

d) Collect bloods prior to the first infusion for:

- Hepatitis C by PCR (Polymerase chain reaction)
- Hepatitis B Surface Antigen
- Serum Save
- Full blood count (FBC)
- Liver Function Testing (LFT)
- Urea and Electrolyte (U& E)
- Immunoglobulins

e) Encourage the patient to drink plenty of fluids before, during and after the infusion.

2.4 Prior to subsequent infusions (INGID, 2019)

- Assess for any active infections
- Assess for any symptoms of infection since the last infusion
- Assess for any adverse reactions to the last infusion
- Assess for any new medications that the patient has been prescribed
- Record the above on the IVIg infusion record (see appendix 1)
- Assess that the immunoglobulin product is prescribed correctly
- Consider pre-medication to prevent any adverse reactions
- Assess if monitoring bloods are needed (routinely 12 weekly FBC, LFT, U&E, Immunoglobulin).

a) Ensure the patient has a printed wrist band in place stating their **Name, Date of Birth** and their **Hospital Number** prior to commencing the infusion. Red printed wrist bands should be used if a known allergy is present. The information on the wrist band should be checked with the patient before the wrist band is placed on.

b) Ensure that all equipment is present:

- Drip stand
- IVIg product
- IV infusion device
- IV administration set (to match the infusion device)
- Personal Protective Equipment
- Air inlet needle
- Safety cannulation pack (22g/24g)
- Bionecter with extension line
- Alcohol swab
- 10mls Normal Saline 0.9% IV flush
- Microspore tape
- Disposable tourniquet

NB: Ensure that all emergency medications are readily available and in date.

If blood tests are required:

- Monovette multi-adaptor
- Monovette blood tubes for blood samples as required
- Immunology, Combined Haematology/Chemical Pathology and Virology forms as required

c) Once venous access has been established the procedure for checking IV medications prior to administration should be followed.

d) The IV administration set should be primed with the immunoglobulin.

e) The infusion should be commenced, using an infusion device, at the minimum infusion rate recommended in the manufacturers 'Summary of Product Characteristics'. If no adverse reactions are observed, the infusion rate may safely be increased after 15minutes (DoH, 2011). (For further IV advice please refer to UHL's Administration of Injectable Drugs Policy (Trust Ref. B25/2010)).

- 30mls/hr increase after 15 minutes to,
- 45mls/hr increase after 15 minutes to,
- 90mls/hr increase after 15 minutes to,
- 120mls/hr increase after 15 minutes to,
- 180mls/hr until the end of the infusion

NB Some patients may not tolerate the infusion at 180mls/hr. This is acceptable and will not affect the efficacy of the immunoglobulin. To avoid any adverse reactions, maintain the infusion rate at the safest speed tolerated.

2.5 Administration as an inpatient

a) Check the patient understands his/her condition. Check for the patient for his/her understanding of IVIg, to ensure verbal consent for treatment has been obtained.

b) Ensure contact telephone numbers for the immunology team are available.

c) Assess for signs of an active infection. Document on the IVIg infusion record. Such signs of an infection could be:

- A temperature of 37.5ºC or above.
- A productive cough or discoloured sputum production.
- A CRP above 20 mgs/l.

If an infection appears to be present inform a Doctor and postpone the infusion until the infection has been treated with antibiotics for at least 48 hours, and the above signs of infection have resolved.

d) Ask the patient if they had any adverse reactions to the last infusion (given on the day case unit).

e) Assess that the immunoglobulin product is prescribed correctly.

f) Ensure that hand washing and asepsis is performed adequately as per hospital policy.

g) Collect bloods for:

- Full blood count (FBC)
- Liver Function Testing (LFT)
- Urea and Electrolyte (U& E)
- Immunoglobulins

h) Ensure the IVIg product is at room temperature.

i) Make sure emergency drugs (e.g. adrenaline) and emergency equipment are available and in working order.

j) Follow the UHL IV Policy for administration of the IV product.

k) Follow the UHL IV monograph for product advice.

l) Ensure that all equipment is present:

- Drip stand
- IVIg product
- IV infusion device
- IV administration set (to match the infusion device)
- Personal Protective Equipment
- Air inlet needle
- Safety cannulation pack (22g/24g)
- Bionecter with extension line
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Some patients may not tolerate the infusion at 180mls/hr. This is acceptable and will not affect the efficacy of the immunoglobulin. To avoid any adverse reactions, maintain the infusion rate at the safest speed tolerated.

o) Record all batch numbers of the IVIg product given in the medical notes.

p) Record any adverse reactions (appendix 2) and treatment in the medical and/or nursing notes

2.6 On completion of infusions

a) After the first infusion; the patient must stay on the medical day case unit for a further observation period of 60 minutes.

b) Patients should be given post infusion advice (verbal or written) for any adverse delayed reactions.

c) The patient should be given contact numbers of the Clinical Nurse Specialists for any advice needed for the possibility of delayed reactions – 0116 258 6711 (LRI).

d) The patient should be given the next date for their IVIg. To maintain theraputic trough levels IVIg should be administered on a 3 weekly basis, but can be given on a four weekly basis to either; 1) promote patient flexibility or 2) due to sickness/active infection. NB if a 4 week appointment is made, this should be followed up by a 2 week appointment and then revert back to 3 weeks.

2.7 Management of adverse reactions

a) Reactions are unlikely once the patient is established on immunoglobulin. If they do occur, it is usually due to the patient having an underlying infection or the infusion rate being given too fast.

b) Common 'post infusion' symptoms that are reported can be flu-like symptoms and tiredness for up to 24 hours post infusion.

c) It is advisable that:

- The following are available on the MDCU whilst infusing;

  Oral Ceterizine 10mgs tablets

  IM Adrenaline 1mg/ml (1:1000) solution for injection

  INH Salbutamol 1mg/ml (2.5mg) nebuliser solution

  IV Hydrocortisone 100mg powder for solution for injection

  Oral Paracetamol 500mgs tablets

- Patients keep oral Ceterizine 10mgs tablets and oral Paracetamol 500mgs tablets at home in case of any delayed mild reactions.

d) Refer to Appendix 2 for the management of adverse reactions to IVIg.

e) If the patient has a moderate or severe adverse reaction, this should be reported to the clinical immunology team on 0116 258 6702.

f) Complete a DATIX form if the patient has a moderate or severe adverse reaction.

2.8.1 Education and Training

a) Clinical immunology staff will be trained in the safe administration of immunolgobulins, internally.

b) Clinical immunology nursing staff will be given the necessary working hours to keep themselves updated via the tri-annual maths assessment. Support will be given for the need to be assessed for ANTT assessment.

2.9 Documentation

a) Each batch number used for a patient should be recorded on the infusion record (appendix 1) by affixing the 'peel off label' from the bottle of immunoglobulin product. There should be one label per bottle.

b) The expiry date of the immunoglobulin product should also be written on the infusion record, adjacent to the respective 'peel off label'.

c) Each infusion event should be signed by the person carrying out the assessment.

d) Bloods should be taken with verbal consent being obtained from the patient. The following bloods are required at the following intervals:

- Immunoglobulin – 12 weekly (with a 3 week gap since the last IVIg infusion to ensure a trough IgG level is obtained).
- Us & Es – 12 weekly
- LFT's – 12 weekly
- FBC – 12 weekly
- Serum Save - annually

e) Trough IgG levels for IVIg patients should be as follows, although it may vary according to clinical status;

- Approx 7.0g/L for patients without bronchiectasis
- Approx 8.0g/L for patients with bronchiectasis

Levels may be higher in some patients including those with specific antibody deficiency and IgG subclass deficiency.

f) IVIg patients should have a consultation and physical examination every 6 months by the Immunology team on the MDCU.

g) Monitoring of patient's respiratory status.

Primary immune deficiency patients may develop respiratory conditions such as bronchiectasis or interstitial lung disease. Their respiratory status should be monitored on a regular basis:

- Spirometry annually
- Full pulmonary function tests every 2 years
- CT thorax as clinically required

3. Education and Training

None

4 Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Patient satisfaction	Patient satisfaction survey	Immunology CNS team	Annually	This will be reported in Monthly Immunology MDT meetings.
Postive clinical outcome	Clinical reviews	Immunology service	6 Monthly	This will be reported in Monthly Immunology MDT meetings.

5 Supporting References

PID UK (2019) Patient information re: treatment options
http://www.immunodeficiencyuk.org/whatarepids/treatment

PID UK (2019) Immunoglobulin therapy
http://www.immunodeficiencyuk.org/static/media/up/PIDUKIgtherapy.pdf

UK PIN (2018) Immunoglobulin Product Choice for Patients with Primary Immunodeficiency
http://www.ukpin.org.uk/docs/default-source/default-document-library/ukpin-position-statement/ukpin-position-statement.pdf?sfvrsn=3928c8b4_8

6 Key Words

Immunoglobulin Replacement Therapy Antibody Deficiency

CONTACT AND REVIEW DETAILS	
Guideline Lead (Name and Title) Shanti Mahabir – Immunology Consultant Author - William Coltman – Immunology CNS	**Executive Lead** Chief Nurse, UHL
Details of Changes made during review: 2.2 b) Addition of fSCIg due to the incorporation of this treatment on the MDCU. Ammendment of website address due to a planned change. 2.4 b) + 2.5 l) Removal of 10mls syringe and normal saline 0.9%. Changed to 10mls normal saline 0.9% IV flush due to stock ancillary availabitly. 2.6 d) Advice on when to plan for a further infusion following a longer period than the prescribed 3 weeks. 2.7 c) Addition of recommendations of rescue medication that shold be readiliy available when infusing on the MDCU and for the patient to have at home to manage any delayed reactions. 5 Website address have been updated.	

Appendix 1 - IVIG Infusion record

Product……..

Weight (kg) ……..

Care plan review date……..

Affix Addressograph label here

DATE		**Comments**
Infection in past 2- 3/52	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Infection today	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Treatment	Yes/No	
Adverse effects	Yes/No	
Cannula site /size and type		
Blood samples	Ig's □ LFT's □ CRP □ GGT □ Other □ ……	

Batch Numbers

Signature	
NAME	
NEXT APPOINTMENT	

DATE		**Comments**
Infection in past 3/52	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Infection today	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Treatment	Yes/No	
Adverse effects	Yes/No	
Cannula site /size and type		
Blood samples	Ig's □ LFT's □ CRP □ GGT □ Other □ ……	

Batch Numbers

Signature	
NAME	
NEXT APPOINTMENT	

DATE		**Comments**
Infection in past 3/52	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Infection today	Yes/No	Cough □Diarrhoea □ Headache □ Joint Pains □ Nasal discharge □ Sinus ache □ Sore Throat □ Wheeze □ Other □……
Treatment	Yes/No	
Adverse effects	Yes/No	
Cannula site /size and type		
Blood samples	Ig's □ LFT's □ CRP □ GGT □	

	Other □ ……

Batch Numbers	**Signature**	
	NAME	
	Next appointment	

Blue Label	**Date;** **Comments:**
Blue Label	**Date;** **Comments:**

Blue Label	**Date;** **Comments:**

Appendix 2 - Adverse reaction checklist

ADVERSE REACTIONS

MILD REACTIONS

These symptoms include:

Itching	Shivering
Muscle aches	Nausea
Flushing	Anxiety
Mild headache	Light headedness/dizziness

- Take the analgesia and/or antihistamine you have been prescribed for such reactions. **DO NOT** take paracetamol if you have already taken a medication containing paracetamol in the past 4 hours or if you have had the equivalent of 8 paracetamol tablets in the last 24 hours.
- The symptoms should gradually pass. Wait half an hour and restart the infusion at its minimum rate. Gradually and carefully increase the infusion rate.

Moderate Reactions

These symptoms include:

Itchy, raised rash	Mild wheezing
Chest tightness/pain	
Worsening or reoccurring mild reaction symptoms	

- If you notice any of these symptoms **STOP** the infusion **immediately**. The symptoms should pass.
- **Contact** your GP **immediately**. This is important so any further treatment can be prescribed.
- You should also take any analgesia and/or antihistamine you have been prescribed for such reactions.
- If the symptoms pass, wait half an hour and restart the infusion at its minimum rate. Gradually and carefully increase the infusion rate as before.
- If you are still experiencing problems, **STOP** the infusion and contact your GP again.

Severe Reactions

These symptoms include:

Tightness of the throat	Sensation of pressure in the chest
Severe dizziness or fainting	Severe headache and shaking
Severe difficulty breathing/wheezing	Moderate symptoms becoming worse.
Collapse	

- **STOP** the infusion **immediately**.
- **Call an ambulance, 999**.
- Keep the bottles of immunoglobulin you have used, as these may need to be examined.
- Remember to complete the adverse reaction section of the infusion record when you can and report the reaction to the Specialist Immunology Nurse as soon as possible.